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Note on the Present Position of Cotton Investigation in India

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ON July 27th, 1910, a deputation of Lancashire Members of Parliament and of Indian and Lancashire Master Cotton Spinners and Manufacturers was received by Lord Morley, the Secretary of State for India, and as the deputation urged upon him the necessity for further assistance on the part of Government for the development of cotton cultivation in India, this brief memorandum was prepared to show the present position of the Indian Agricultural Departments in the matter. This is now published for the information of the public.

The work for the improvement of cotton which has been done in the past is as under:—

(1) Survey of indigenous varieties.
(2) Selection and distribution of seed.
(3) Hybridisation.
(4) Introduction of exotic varieties into places where they are likely to succeed.
(5) Trial of tree cottons.
(6) Introduction of superior country varieties in localities where they promise success.
(7) Improvement in methods of cultivation.
(8) Extension of cotton cultivation.

With the exception of the trials with tree cottons which have failed and have consequently been given up, work under all the other heads has been continuous and progressive and is at present engaging a very large share of attention of the Agricultural Department in the cotton areas. It seems almost necessary to emphasise this point as it would appear that some of the members of the deputation that waited on Lord Morley in July last held quite opposite impressions. Thus Mr. Wadia who represented the

Bombay Millowners' Association stated that "so far most of the attention of the Government officials has been devoted to cotton raised from American or Egyptian seed" and Mr. Johnson, representing the Upper India Chamber of Commerce, repeats almost the same thing. This is far from being the case as will be seen from the brief abstract given below of the work which has been or is being done under the headings mentioned above.

(1) *Survey of indigenous varieties.*—In 1902 and succeeding years, samples of indigenous cotton seed were obtained from all the provinces of India and grown at various centres. This collection became, in time, a complete representative of the many types of cotton grown in the country. A classified account of these was prepared by Mr. Gammie, then Economic Botanist of the Bombay Presidency, and was published as a handbook to help the workers in the provinces. The Provincial Economic Botanists have further been making a close study of the characteristics of the various forms of the cotton plant grown in their respective provinces, the object being the isolation and maintenance of pure types, their improvement in outturn or quality by selection or hybridisation, and lastly the introduction of the improved plant into general cultivation. It is fully recognised by the Department that the improvement of the indigenous plant rather than the introduction of exotics is the more important aspect of the problem, and the bulk of the work now being carried out is in this direction.

(2) *Selection and distribution of seed.*—This line of work is now being followed by agriculturists and botanists on Government Experimental Stations, and the results obtained up to date are very encouraging. The expert opinion goes to show that great improvement in yield and quality of indigenous varieties can be effected by seed selection. On the Surat (Bombay) farm, specially selected seed of Broach cotton yielded between 500 and 600 lbs. per acre with a ginning percentage of 32·5, which is a great advance as compared with the yield of 450 lbs. with a ginning percentage of 31·9 from an unselected sample. At Koilpatti (Madras), yearly selection of the best plants and also crossing them *inter se* have produced a variety which gives 34 per cent. of lint—an increase of 7 per cent. over the local crop—and another variety has been envolved by selection with a staple equal to Upland Georgian and

fit for spinning 40^s. twist. In the United Provinces the selection of one variety from among the mixture usually sown by the cultivator has given an increase of over 20 per cent. In the Central Provinces, Malvensis—a type selected from a mixture locally grown—has been found to be very promising, and the area under it is extending gradually. There are a number of self-supporting private seed farms in this province which are supervised by special Cotton Assistants. Last year, the total quantity of seed distribution from these farms and also from Government Agricultural Stations amounted to about 123,000 lbs. In other cotton tracts, *e.g.*, at Dharwar in the Karnatak (Bombay), Dhulia in Khandesh (Bombay), Bellary in Madras and at Lyallpur in the Punjab, similar work in plant improvement is in progress with a view either to improve the quality or to increase the ginning percentage.

(3) *Hybridisation.*—Experiments in the hybridisation of cotton are being carried out on various farms. Their progress is naturally slow, but they warrant the expectation of results of great importance, especially on the question of quality. At Surat (Bombay), some of the best hybrids have given a lint valued considerably in excess of the local variety. Seed of a few of these hybrids was distributed among cultivators in 1909. The resulting crop was generally superior to that grown from ordinary seed and the value obtained was 5 per cent. more than that for Surat cotton. At Gadag near Dharwar, hopeful results have been obtained with crosses between different kinds of Uplands. At Nadiad some excellent crosses have been evolved from Texas and Bourbon and also Egyptian and Sea Island and Bourbon. At Dhulia, hybridising experiments are conducted with a view to combine quality and outturn. In the United Provinces where the subject is receiving almost the whole-time attention of the Economic Botanist several crosses have been recently produced which give promise of being a great improvement on the present local varieties.

(4) *Introduction of exotic varieties where they have been found successful.*—Experiments have been in progress for the last seven years with exotic cottons, and the experience gained goes to show that their extension is most promising in the alluvial plains of Upper India with canal irrigation. As a result of several experiments, it is believed that from 10,000 to 20,000 acres of Egyptian cotton of the Metafifi variety can be successfully grown on the

Jamrao Canal in Sind if Egyptian methods of cultivation are closely followed.

It is now also certain that a good class of American cotton can be produced under average circumstances in Sind. It has a shorter growing period than local cotton, and there is a very large area on which it can be cultivated. During the current season, it is being grown in Upper Sind where at present there is no cotton and also in some districts of Lower Sind. The establishment of buying agencies will, however, be a necessary adjunct to its successful cultivation.

Cottons of the Upland American type seem to thrive in a certain tract of the Southern Mahratta Country. A form of Upland Georgian passing under the name of Cambodia has given great promise. It is rapidly spreading in the Tinnevelly District of Madras, and the local Agricultural Department is trying to push its cultivation by free supply of small quantities of seed. In the Bombay Presidency it has been giving very good results at Dharwar, Poona and Surat.

In the Central Provinces, Buri, a type of Upland Georgian which has been in India for some time, is being pushed with success. It gives a better yield than the local Jari and has also a better percentage of lint and is wilt resistant. About 40,000 lbs. seed of this cotton was sold last year, and many cultivators have taken up its cultivation.

In parts of the United Provinces, agricultural conditions seem suitable for the cultivation of acclimatised American cotton, but the want of a market for long staple has restricted extended cultivation. Similarly in the Punjab, owing to the want of a market, the cultivation of the Dharwar American (which has proved suitable to certain districts) has not increased. A slightly higher price than that realised as well as ordinary marketing facilities are needed to ensure cultivation on a really considerable scale.

One great difficulty in persuading the farmer to grow long staple cotton arises from his inability to obtain adequate remuneration for the extra time and care involved in its production. The Agricultural Departments, by auctions and otherwise, have attempted to obtain fair prices for crops grown at their recommendation, but such intervention is limited in its extent. The establishment of agencies in a few of the more important cotton producing centres for buying long staple cotton would tend to the removal of this difficulty.

(5) *The trial of tree cottons.*—As above noted the Department has failed to secure any satisfactory results from these trials, and it has been decided to spend no more money in this direction.

(6) *Introduction of superior country varieties in localities where they are succeeding.*—There has been a marked extension of this line of work, especially in Bombay and Madras. The introduction of Broach cotton into the Southern Mahratta Country has been attended with considerable success. On account of its much higher ginning percentage, its greater yield and superior colour, its cultivation is more profitable to ryots than the local Kumpta cotton. The cultivation of this cotton has so much advanced during the past two years that at the annual auction organised by the Department in 1910 cotton was sold for a total value of R1,11,155 as against R8,398 in 1908.

The introduction of pure Karungany in the Tinnevelly District of the Madras Presidency has been attended with similar success. This variety yields lint of much better quality than the mixture of Uppam and Karungany which is usually grown. Through the efforts of the Department, the cultivation of pure Karungany has increased in recent years. It now predominates all through the southern part of the district. About 80,000 acres were sown with pure seed in 1909. Seed farms have been opened in several villages, and it is proposed to confine distribution to seed grown on these farms which will be supplied with seed from the Agricultural Stations where the crop is being improved year by year.

(7) *Improvement in methods of cultivation.*—The practice of growing cotton broadcast is prevalent in many parts of India, and experiments are being made to determine whether drill sowing and interculture appreciably affect the outturn in quantity or quality. In certain districts of the Madras Presidency where the ryots used to sow their seed broadcast, the introduction of drills has been a thorough success. Expert cultivators were, in the first instance, sent to teach the use of the country drill and bullock-hoe and to demonstrate the value of improved cultivation. Implements also were supplied free of cost and expert labourers sent to help the

there are a number of self-supporting private seed farms. The cultivators in some places are realising the value of raising pure seed, and as the farms are scattered throughout the cotton tracts, they now have in many places an opportunity of exercising personal judgment on the work of the Department. In course of time when the cultivator finds that it pays him to put higher class cotton on the market, he can be safely left to himself. More cannot be done in this direction than is already being done. As pointed out in another place what is required is the establishment of buying agencies to enable cultivators to get a fair price for their improved cotton, and until this is secured there would be no object in enlarging the number of seed farms.

(2) One of the difficulties in the way of improvement of cotton in India is the maintenance of pure seed. Cultivators have unfortunately abandoned the practice of hand ginning seed for their own actual requirements and accept whatever is given them from the ginning factories, and the consequence is an admixture of several varieties. We may go on separating varieties, but if it is all going to be mixed up again every year at the gins we shall never get much further; while any new variety that we may introduce will merely be a fresh ingredient in the existing mixture. We are doing what we can to face these difficulties, but what is wanted is the co-operation of the trade. This co-operation could be best given by the establishment of the buying agencies already mentioned, which besides buying the cotton would also gin it, keep the varieties separate and return to the cultivator good and reliable seed.

(3) With regard to the recommendation of the deputation to induce cultivators to adopt better methods of cultivation, it may be pointed out that the success of this work depends largely on the resources and character of the cultivator. The introduction of improvements into Indian agriculture is beset with peculiar difficulties. We have first to gain the confidence of the ryots, then to convince them of the utility of our suggested improvements and finally to show them that it will pay them to adopt them. The supply of cheap capital also enters largely into the problem. A number of methods have been adopted for this purpose, and most of them have been found to be effective. Among them the most important has been the formation of Agricultural Associations for the purpose of

arousing intelligent interest in the question of agricultural improvement among members who are usually well-to-do cultivators. By organising demonstrations on cultivators' fields, by special demonstration farms and by the distribution of leaflets, the Agricultural Departments are trying to bring home to cultivators the advantages of proved agricultural improvements. We are likewise looking forward to the help which will be given to the cultivator by the spread of co-operative societies, on which we greatly depend for the introduction of improvements which require capital. The successful introduction of the drill system in the Tinnevelly District of Madras is an example of the results attained by the efforts of the department. In Sind, the Deputy Director of Agriculture has found by preliminary experiments that if correct methods of cultivation are followed there is every possibility of success with Egyptian cotton. The Government of Bombay is doing its best to induce the ryots to adopt better methods; it has also sanctioned for one year a rebate of one rupee of land revenue on every acre sown with Egyptian cotton.

As regards the use of fertilisers for cotton, the matter is receiving the attention of the officers of the department, and that manurial experiments are in progress, notably in the Bombay Presidency and Central Provinces, to test the effect of manures on the cotton crop.

(4) The deputation recommends the engagement in each province of a separate department for cotton with suitable staffs. In this connection, reference may be made to the reply given by the Board of Agriculture held at Pusa in 1905 to a similar recommendation, among others, made by the British Cotton Growing Association in their memorial of 26th September 1904 presented to Lord Curzon. The Board therein urged the necessity of strengthening the provincial departments of agriculture by the appointment of specialists. Since then an expert European staff has been added to each provincial department of agriculture and an Imperial Cotton Specialist has been appointed. This staff is considered sufficient for the present, and until the trade assists in the buying, ginning, baling and exporting of long staple cotton, an increase in the staff merely for cotton work is undesirable.

(5) In the preceding paragraphs the necessity of establishing cotton buying agencies for aiding the production of long stapled

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